CLAIMS

1. A piezoelectric transformer comprising a piezoelectric body which comprises a primary portion and a secondary portion, both the primary portion and the secondary portion being able to generate and transform piezoelectric vibrations in accordance with an AC Voltage fed to one portion while a transformed voltage can be delivered from the other portion, the piezoelectric body being constituted by a substantially annular body the primary and secondary portions of which have been polarized substantially perpendicular to the peripheral direction of the annular body, the transformer being adapted to be operated at a resonance frequency of a dimension of a cross-section of the annular body substantially perpendicular to the peripheral direction of the annular body.

2. A piezoelectric transformer according to claim 1, wherein the substantially annular body is an annular body.

3. A piezoelectric transformer according to claim 2, wherein the resonance frequency of a dimension of a cross-section of the annular body substantially perpendicular to the peripheral direction of the annular body is a resonance frequency of the thickness of the annular body.

3. A piezoelectric transformer according to claim 1, wherein the primary and the secondary portions of the piezoelectric body have been polarized in the thickness direction of the piezoelectric body.

4. A piezoelectric transformer as claimed in claim 1, wherein the primary portion of the annular piezoelectric body has been substantially radially polarized.

6. A piezoelectric transformer as claimed in claim 1, wherein the secondary portion is provided with a plurality of inner electrodes.

7. A piezoelectric transformer as claimed in claim 1, wherein the piezoelectric body is annular, having a through-going opening defined therein.

8. A piezoelectric transformer as claimed in claim 7, wherein the opening is a through-going opening in the thickness direction of the body.

9. A piezoelectric transformer as claimed in claim 8, wherein the annular piezoelectric body is shaped as a hollow circular cylindrical body, the opening being a circular cylindrical opening having substantially the same center as the cylindrical body.

10. A piezoelectric transformer as claimed in claim 8, wherein the annular piezoelectric body is shaped as a double cone having its largest diameter at or close to the middle of the body.

11. A piezoelectric transformer as claimed in claim 8, wherein the opening is shaped as a double cone having its smallest diameter at or close to the middle of the body.

12. A piezoelectric transformer as claimed in claim 1, wherein the ratio b/h between width b of the wall of the annular body and the height h of the wall of the annular body (the height h being the thickness of the annular body) is at the most 0.25.

13. A piezoelectric transformer as claimed in claim 1, wherein the ratio b/h is between 0.35 and 0.8.

14. A piezoelectric transformer as claimed in claim 1, wherein the ratio b/h is between 0.4 and 0.7.

15. A piezoelectric transformer as claimed in claim 1, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 0.5.

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16. A piezoelectric transformer as claimed in claim 15, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 1.

17. A piezoelectric transformer as claimed in claim 1, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 1.5.

18. A piezoelectric transformer as claimed in claim 1, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 2.

19. A piezoelectric transformer as claimed in claim 1, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 3.

20. A piezoelectric transformer as claimed in claim 1, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 5.

21. A piezoelectric transformer as claimed in claim 1, wherein the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is in the interval of 1-5.

22. A piezoelectric transformer as claimed in claim 1, which contains a separate galvanic separation layer between the primary and the secondary portions.

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23. A piezoelectric transformer as claimed in claim 1, wherein the electrodes of one or both portions of the piezoelectric body are embedded in their respective portion, and the piezoelectric material between the respective other portion and the embedded electrode which is closest to that other portion is used as a galvanic separation while still actively participating in the power transfer.

SUB a3 cancel'd.

24. A piezoelectric transformer comprising a piezoelectric body which comprises a primary portion and a secondary portion, both the primary portion and the secondary portion being able to generate and transform piezoelectric vibrations in accordance with an AC Voltage fed to one portion while a transformed voltage can be delivered from the other portion, the electrodes of one or both portions of the piezoelectric body being embedded in their respective portion, and the piezoelectric material between the respective other portion and the embedded electrode which is closest to that other portion is used as a galvanic separation while still actively participating in the power transfer.